



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/893,998	06/29/2001	Franz Cemic	2098L/49970	5656

7590 10/12/2004  
CROWELL & MORING LLP  
Intellectual Property Group  
P.O. Box 14300  
Washington, DC 20044-4300

EXAMINER
----------

LAVARIAS, ARNEL C

ART UNIT	PAPER NUMBER
----------	--------------

2872

DATE MAILED: 10/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/893,998

Applicant(s)

CEMIC ET AL.

Examiner

Arnel C. Lavarias

Art Unit

2872

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --****Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 7/29/04, 6/2/04.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2-8 and 10-12 is/are pending in the application.
- 4a) Of the above claim(s) 3, 4, 7 and 8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2, 5, 6 and 10-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 6/2/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The International Search Report, listed in the 'Non Patent Literature Documents' section of PTO-1449 submitted 6/2/04 has been lined through, as it is not prior art in and of itself. However, the substance of the International Search Report has been considered.

### ***Response to Amendment***

2. The cancellation of Claims 1 and 9 in the submission dated 7/29/04 is acknowledged and accepted.

### ***Response to Arguments***

3. The Applicants' arguments filed 7/29/04 have been fully considered but they are not persuasive.
4. The Applicants argue that, with respect to Claims 1-2, 9-10, Tsuji fails to teach or reasonably suggest the homogenizing optical system homogenizing the nonuniform intensity distribution in the image field of the light emerging from the optical fiber bundle. The Examiner respectfully disagrees. It is noted that Tsuji specifically discloses that the light mixing means (i.e. optical pipe(s) 4 in Figures 1 or 6) only create a uniform intensity distribution at or adjacent to the light exit surface of the light mixing means (i.e. 4' in Figure 1; See col. 5, lines 3-28). Hence, at any other location after the light exit surface, the light intensity distribution will be nonuniform. Further, with regard to

arguments that the homogenizing optical system and lens member of Tsuji (See 7, 8 in Figure 6) are incapable of superimposing the exit opening in an intermediate image plane to form a homogeneous intermediate image, the Examiner notes that not all the light rays are drawn as shown for light rays exiting element 7. The light rays shown in Figure 1 (i.e. the light rays exiting element 7 in Figure 1) specifically show that the homogenizing optical system and lens member of Tsuji superimpose the exit opening in an intermediate image plane (i.e. the plane defined by element 9 in Figures 1 or 6) to form a homogeneous intermediate image, which is then projected to wafer 94 in Figure 6.

5. The Applicants argue that, with respect to Claims 9-10, Tsuji fails to teach or reasonably suggest only the homogenizing optical system performing the function of homogenizing the light. After a review of the Tsuji reference, the Examiner agrees, and respectfully withdraws the rejections of Claims 9-10 in Section 9 of the Office Action dated 4/29/04.
6. The Applicants argue that, with respect to Claims 1-2, 9-10, Nakanishi et al. fails to teach or reasonably suggest the homogenizing optical system homogenizing the nonuniform intensity distribution in the image field of the light emerging from the optical fiber bundle. The Examiner respectfully disagrees. It is noted that features upon which applicant relies (i.e., an intermediate plane *outside an object*) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Additionally, the homogenizing optical system (i.e. 8 in Figure 1), along with the adjacent lens (i.e. 9 in Figure 1), project a

Art Unit: 2872

uniform intensity distribution in the region of space near element 10, with adjacent element 11 further focusing this uniform intensity distribution to the wafer (i.e. 12 in Figure 1). It is additionally noted that homogenization of the light intensity distribution is only performed by the homogenizing means (See 8 in Figure 1).

7. The Applicants argue that, with respect to Claims 1-2, 5-6, 9-12, Suzuki '377 in view of Suzuki '575 fails to teach or reasonably suggest the invention as recited in Claims 1-2, 5-6, 9-12. The Examiner respectfully disagrees. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., measurement of either a position or a coordinate; the homogenizing optical system comprising a micro-honeycomb condenser and lens member which are not recited in Claims 1 and 5) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Additionally, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In the instant case, Suzuki '377 discloses that the homogenizing optical system includes a fly's eye lens, which is a honeycomb lens element, as well as a lens (See 16 34a, 34b 38 in Figure 1; col. 9, line 66-col. 10, line 47), and further that Suzuki does not disclose any other element besides the fly's eye lens that performs the function of homogenizing the intensity distribution. Suzuki '575, as

previously noted, is being relied upon for the general teaching in the art that optical fiber waveguides or fiber bundles, and coupling lenses to and from the waveguide or bundles, may be used to flexibly route light within the optical system. Additionally, with respect to the detector device, Suzuki '377 specifically discloses that the illumination light, which also includes measurement marks from a reticle in the beam path, must pass through the pattern/feature (See for example Figure 3; col. 14, line 51-col. 16, line 33), and hence the detector device would be able to determine the position of the pattern/feature. The Examiner also notes that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Finally, with regard to arguments concerning a coordinate measuring system, the applicant is reminded that preambular phrases, unless structurally distinguishable from the prior art, are normally not given patentable weight. In the instant case, the combined teachings of Suzuki '377 and Suzuki '575 discuss devices that include all of the positively recited structural limitations recited in Claims 2, 5-6. Thus, Suzuki '377 in view of Suzuki '575 supports the title "coordinate measuring system" in the same manner as the structure of the claim.

8. Claims 2, 5-6, 10-12 are rejected as follows.

***Claim Rejections - 35 USC § 102***

Art Unit: 2872

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claim 2 is rejected under 35 U.S.C. 102(e) as being anticipated by Tsuji (U.S. Patent No. 6285855), of record.

Tsuji discloses an illumination device (See for example Figure 6) having a light source (See 1 in Figure 6); an optical waveguide (See 4 in Figure 6); a coupling-in optical system which couples the light of the light source into a first end of the waveguide (See 91, 92, 2, 3 in Figure 6); a coupling-out optical system which couples out the light emerging from a second end of the optical waveguide (See 5 in Figure 6); and an illumination optical system (See 93 in Figure 6) which receives the light emerging from the coupling-out optical system and illuminates an imaging field (See 94 in Figure 6), the illumination device further comprising an optical fiber bundle which is arranged as the optical waveguide (See 4 in Figure 6; col. 4, line 43-col. 5, line 28); and a homogenizing optical system which is arranged between the coupling-out optical system and the illuminating optical system (See 7 in Figure 6), wherein the homogenizing optical system homogenizes the nonuniform intensity distribution in the image field of the light emerging from the optical fiber bundle (See col. 5, lines 29-43), wherein the homogenizing optical system comprises a micro-honeycomb condenser (See 7 in Figure

6; col. 5, lines 29-43) and a lens member (See 8 in Figure 6) which superimposes the exit opening of the fiber bundle in an intermediate image plane to form a homogeneous intermediate image (See for example 9 in Figure 6).

11. Claims 2, 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakanishi et al. (JP04196280), of record.

Nakanishi et al. discloses an illumination device (See for example Figure 1) having a light source (See 1 in Figure 1); an optical waveguide (See 3 in Figure 1); a coupling-in optical system which couples the light of the light source into a first end of the waveguide (See 2, 4 in Figure 1); a coupling-out optical system which couples out the light emerging from a second end of the optical waveguide (See 7 in Figure 1); and an illumination optical system (See 11 in Figure 1) which receives the light emerging from the coupling-out optical system and illuminates an imaging field (See 12 in Figure 1), the illumination device further comprising an optical fiber bundle which is arranged as the optical waveguide (See 3 in Figure 1; Abstract); and a homogenizing optical system which is arranged between the coupling-out optical system and the illuminating optical system (See 8 in Figure 1), wherein the homogenizing optical system homogenizes the nonuniform intensity distribution in the image field of the light emerging from the optical fiber bundle (See Abstract), wherein the homogenizing optical system comprises a micro-honeycomb condenser (See 7 in Figure 1) and a lens member (See 9 in Figure 1) which superimposes the exit opening of the fiber bundle in an intermediate image plane to form a homogeneous intermediate image (See for example region near 10 in Figure 1).



***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 2, 5-6, 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. (U.S. Patent No. 6456377 or Suzuki '377), of record, in view of Suzuki (U.S. Patent No. 5608575 or Suzuki '575), of record.

Suzuki '377 discloses an exposure system, which incorporates a coordinate measuring instrument including an illumination device (See for example Figures 1-2), the coordinate measuring device having a horizontally X-Y displaceable measurement stage (See 50 in Figure 1) for receiving a substrate (See W in Figure 1; or 62 in Figure 2) with a feature (See 64 in Figure 2; col. 14, line 58-col. 15, line 28) that is to be measured; an illumination system; and a detector device for determining the position of the feature (See 100 in Figure 1; 70 in Figure 2); and the illumination device having a light source (See 12, 14 in Figure 1), and an illumination optical system (See 40a, 40b, PL in Figure 1) which receives the light emerging from the light source and illuminates an imaging field; the illumination device further comprising a homogenizing optical system which is arranged between the light source and the illuminating optical system (See 16 in Figure 1), wherein the homogenizing optical system homogenizes the nonuniform intensity distribution in the image field of the light emerging from the light source (See col. 9, line 66-col. 10, line 47; col. 14, lines 27-50), wherein the homogenizing optical system

comprises a micro-honeycomb condenser (See 16 in Figure 1; col. 9, line 66-col. 10, line 47; col. 14, lines 27-50) and a lens member (See for example 34a, 34b, 38 in Figure 1) which superimposes the exit opening of the fiber bundle in an intermediate image plane to form a homogeneous intermediate image. Suzuki '377 lacks an optical fiber bundle; a coupling-in optical system which couples the light of the light source into a first end of the waveguide; and a coupling-out optical system which couples out the light emerging from a second end of the optical waveguide. However, Suzuki '575 teaches a similar exposure system, including an illumination device (See Figure 4), the device having a horizontally X-Y displaceable measurement stage (See 45 in Figure 4) for receiving a substrate with a feature that is to be measured (See 43 in Figure 4); an illumination system; and a detector device (See 47, 48 in Figure 4); and the illumination device having a light source (See 11, 12 in Figure 4); an optical waveguide (See 15 in Figure 4); a coupling-in optical system which couples the light of the light source into a first end of the waveguide (See 12, 13, 14 in Figure 4); a coupling-out optical system which couples out the light emerging from a second end of the optical waveguide (See 16a, 16b, 17, 18 in Figure 4); and an illumination optical system (See 28, 42 in Figure 4) which receives the light emerging from the coupling-out optical system and illuminates an imaging field (See 41, 46a, 46b, 43 in Figure 4); the illumination device further comprising an optical fiber bundle which is arranged as the optical waveguide (See 15 in Figure 4; col. 10, lines 35-58); and a homogenizing optical system which is arranged between the coupling-out optical system and the illuminating optical system (See 19 in Figure 4), wherein the homogenizing optical system homogenizes the nonuniform intensity distribution in the

image field of the light emerging from the optical fiber bundle (See col. 10, line 59-col. 11, line 35), wherein the homogenizing optical system comprises a micro-honeycomb condenser (See 19 in Figure 4; col. 11, lines 19-35) and a lens member (See for example 22 in Figure 6) which superimposes the exit opening of the fiber bundle in an intermediate image plane to form a homogeneous intermediate image (See for example 24 in Figure 4; col. 12, lines 24-50). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the device of Suzuki '377 further include an optical fiber bundle; a coupling-in optical system which couples the light of the light source into a first end of the waveguide; and a coupling-out optical system which couples out the light emerging from a second end of the optical waveguide, as taught by Suzuki '575, for the purpose of diffusing the light emitted from the light source, while allowing ease in alignment in routing the light within the optical system.

### *Conclusion*

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent Application Publication US 2001/0033490 A1 to Koyama et al.

Koyama et al. is being cited to evidence an illumination device and coordinate measuring instrument (See for example Figures 1-2), similar to that recited in the instant application. The use of an optical fiber bundle and a homogenizing optical system (e.g.

Art Unit: 2872

fly's eye lens and additionally lens (See 40, 16A, 17A in Figures 1-2) are of particular significance.

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 571-272-2315. The examiner can normally be reached on M-F 8:30 AM - 5 PM EST.

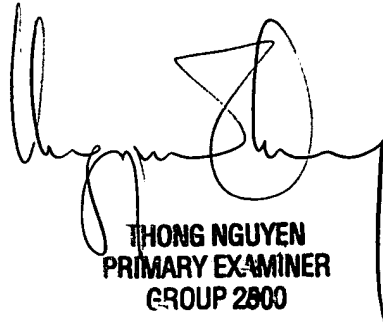
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2872

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Arnel C. Lavarias  
10/6/04



**THONG NGUYEN**  
**PRIMARY EXAMINER**  
**GROUP 2800**